

CERTIFIED MAIL 7018 3090 0001 9999 0191

July 29, 2019

Air and Radiation Division U. S. Environmental Protection Agency, Region V 77 West Jackson Boulevard, Chicago, IL 60604

RECEIVED AUG 0 8 2019

AIR ENFORCEMENT BRANCH U.S. EPA REGION 5

Re: Submittal of U. S. Steel – Minntac and Keetac Compliance Reports per the Requirements of 40 CFR Part 52.1235(e)(5) through (7) – Taconite Regional Haze FIP

U. S. Steel - Keetac (Keetac)

Keetac utilizes Ametek Model 920 analyzers to measure NOx and SO₂ (Serial Number AE-920-10086-1).

Keetac submits quarterly excess emission reports to the Minnesota Pollution Control Agency. Therefore, to fulfill the requirements of the excess emissions and monitoring system performance reports, a copy of the quarterly excess emissions report for the 2nd quarter is included in this submittal. Where EPA's requirements per the regulation differ from Minnesota's requirements, this information is also being included.

Any periods of startup and shut down are reported in Section 5 of the DRF-1 Form included in this submittal. There were no deviations during this reporting period.

The emission limitation for SO2 (the only pollutant currently in effect) is $225 \, \text{lbs/hr} - 30 \, \text{day}$ rolling average. There were no deviations associated with the emission limit.

The last CEMS CGA was conducted on June 13, 2019 and is included in this submittal. The last CEMS RATA was conducted on March 19, 2019 and was previously submitted.

U. S. Steel – Minntac (Minntac)

Minntac utilizes Ametek Model 920 analyzers to measure NOx and SO₂. The table below outlines the serial numbers for each of the units:

Line 3	AE-920-10086-1	
Line 4	AE-920-10086-2	
Line 5	AE-920-10086-3	
Line 6	ZA-920-10336-1	
Line 7	ZA-920-10336-2	

Minntac submits quarterly excess emission reports to the Minnesota Pollution Control Agency. Therefore, to fulfill the requirements of the excess emissions and monitoring system performance reports, a copy of the quarterly excess emissions report for the 2nd quarter is included in this submittal. Where EPA's requirements per the regulation differ from Minnesota's requirements, this information is also being included.

Any periods of startup and shut down are reported in Section 5 of the DRF-1 Form included in this submittal. There were no deviations during this reporting period.

The emission limitation for SO_2 is a 30-day rolling average aggregate limit for indurating lines 3-7 of 498 lbs/hr when all lines are producing flux pellets, 630 lbs/hr when producing acid pellets or using the equation in 40 CFR 52.1235(b)(2)(iii) when the 30 day period includes both acid and flux pellet production. There were no deviations associated with the emission limit.

The emission limitation for NOx on Line 6 and Line 7 is 1.5 lbs/MMBtu based on a 30-day rolling average. However, for any 30 or more consecutive days when only natural gas is used, a limit of 1.2 lbs/MMBtu applies. There were no deviations associated with the emission limit for Line 6 and Line 7.

The latest CEMS RATA was conducted on Lines 3-7 on May 15-16 and May 20-22, 2019. This report was submitted on July 10, 2019 The last CGAs were performed on February 21-22, 2019 and the results were reported in last quarter's report.

If you should require any additional information, please contact me at scampbell@uss.com or 218-778-8684.

Sincerely,

Stephani Campbell

Environmental Control

Alephane Campbell



U. S. Steel Corporation Minnesota Ore Operations P.O. Box 217 Keewatin, MN 55753

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AIR ENFORCEMENT BRANCH U.S. EPA REGION 5

CERTIFIED MAIL 7018 3090 0001 9999 0177

July 29, 2019

Air Quality Compliance Tracking Coordinator Minnesota Pollution Control Agency 520 Lafayette Road North St. Paul, MN 55155-4194

Re:

U. S. Steel – Keetac Administrative Order by Consent Quarterly Continuous Monitoring System Deviation Report

Dear Supervisor:

Enclosed with this letter is U. S. Steel – Keetac's (Keetac) Quarterly Continuous Emission Monitoring System Deviation report for the 2nd quarter of 2019. The Continuous Emission Monitoring System (CEMS) was certified on Keetac's Waste Gas Stack on November 6th, 2008. The CEMS was installed as a part of Keetac's Administrative Order by Consent with the State of Minnesota effective September 27th, 2007.

Deviations associated with Emission Limits

There was one deviation associated with emission limits.

Deviations associated with Monitor Downtime

There were thirty four instances of monitor downtime that affected either NO_x or SO₂. The individual downtime duration and cause is listed in the monitor downtime section of this report.

Deviations associated with Monitor Bypass

Keetac utilizes a grate/kiln system for pelletizing taconite. Although this is an extremely hot process (with temperatures exceed 2500 °F in the kiln), the equipment is designed to withstand the high temperatures and will do so during normal operation. However, the grate is very susceptible to heat damage during upset conditions or if stopped for any reason while it is hot. To prevent equipment damage and heat related safety issues during these situations, large amounts of heat must be released from the grate as soon as possible. For that reason the system was designed

such that when the grate stops or gets overheated, a stack cap is lifted to release heat through an emergency stack. At this time the monitor is bypassed. These situations are the only times the monitor is bypassed. Because they represent upset conditions or process downtime (production loss), the company has a strong vested interest in minimizing both the number and duration of occurrences.

The times listed in the monitor bypass section are when the grate emergency stack cap is open and there is combustion in the kiln. This is the only time when any NO_x and SO_2 are emitted. Times when the cap is open but there is no combustion in the kiln are not listed.

If you have any questions concerning these forms, please contact Stephani Campbell at (218) 778-8684.

Sincerely,

Lawrence Sutherland General Manager

U. S. Steel - Minnesota Ore Operations

Enclosure

cc: Steve Palzkill - MPCA

File



Excess Emissions Reporting Form - DRF-1

Continuous Monitoring Systems Reporting Form

Please note: This form has been updated. Please print, complete and remit only the forms. Please see the instructions in the Word version of DRF-1 to ensure proper use and understanding of definitions. DO NOT print and return the instructions.

Use this form to record and report excess emissions (EE) that are identified by Continuous Monitoring Systems. This includes Continuous Emission Monitoring Systems (CEMS) and Continuous Opacity Monitoring Systems (COMS). DRF-1 is the form you must use to report excess emissions from a stack as recorded by your facility's Continuous Emission Monitoring Systems (COMS).

Address hard copy C

Compliance Tracking Coordinator, Fourth Floor

Minnesota Pollution Control Agency

520 Lafayette Road North St. Paul, MN 55155-4194

1) General Facility Information

Company name: U. S. Steel - Keetac

AQ file no.: 62B Report covers Quarter: Second

13700063-005

Year:

AQ permit no.:

2) CEMS/COMS Data Summary Table

	2g)	Total EE % of TOT	%00.0	0.05%	
sions (EE)	4m)	Cumulative Total Duration of All EE	0	-	
Duration of Excess Emissions (EE)	2f)	Exempt EE % of TOT Cumulative Total Duration of All EE	N/A	N/A	
	4I)	Mountime Cumulative % Of TOT Duration of Exempt EE			
owntime	2e)	Downtime % Of TOT	1.3% N/A	1.3% N/A	
Duration of Monitor Downtime	3i)	Total Duration of Monitor Downtime Cumulative Downtime (hr) % Of TOT Duration of Exempt EE	25	25	
.	2d)	Total Op (To	1895	1895	
	2c)	EU/SV ID Number	SV 051	SV 051	
	(2p)	Monitor ID Monitor ID EU/SV ID Number Pollutant Number	XON		
	2a)	Monitor ID Number	Line 2	Line 2	

RECEIVED AUG 0.8 2019 AIR ENFORCEMENT BRANCH U.S. EPA REGION 5 3) Duration of Monitor Downtime: Provide the following information regarding each period of monitor downtime. Make a separate table for each monitor, as needed.

3a)	3b)	3c)	3d)	3e)	3f)	nonitor downtime, wake a separate tabi 3g)	3h)
	Monitor ID Pollutant or Parameter	Emission Unit Being Monitored	Beginning Date and Time of Downtime	End Date and Time of Downtime	Duration of Downtlme (min)	Reason for Monitor Downtime (clarifying comments)	Corrective ActionTaken (clarifying comments)
ine 2	SO2	SV 051	04/03/2019 06:00:00	04/03/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
ine 2	SO2	SV 051	05/11/2019 06:00:00	05/11/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
ine 2	SO2	SV 051	05/14/2019 16:00:00	05/14/2019 16:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
ine 2	SO2	SV 051	05/20/2019 06:00:00	05/20/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
ine 2	SO2	SV 051	05/21/2019 06:00:00	05/21/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
ine 2	SO2	SV 051	05/25/2019 11:00:00	05/25/2019 12:59:00	120	Primary Analyzer Malfunction	Performed necessary maintenance
ine 2	SO2	SV 051	05/25/2019 14:00:00	05/25/2019 16:59:00	180	Primary Analyzer Malfunction	Performed necessary maintenance
ine 2	SO2	SV 051	06/05/2019 01:00:00	06/05/2019 01:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
ine 2	SO2	SV 051	06/05/2019 06:00:00	06/05/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
ine 2	SO2	SV 051	06/05/2019 08:00:00	06/05/2019 08:59:00	60	Preventative Maintenance	Performed necessary maintenance
ine 2	SO2	SV 051	06/05/2019 11:00:00	06/05/2019 11:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
ine 2	SO2	SV 051	06/12/2019 03:00:00	06/12/2019 03:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
ine 2	SO2	SV 051	06/13/2019 01:00:00	06/13/2019 02:59:00	120	Primary Analyzer Malfunction	Performed necessary maintenance
ine 2	SO2	SV 051	06/14/2019 23:00:00	06/15/2019 00:59:00	120	Primary Analyzer Malfunction	Performed necessary maintenance
ine 2	SO2	SV 051	06/15/2019 02:00:00	06/15/2019 05:59:00	240	Primary Analyzer Malfunction	Performed necessary
ine 2	SO2	SV 051	06/15/2019 06:00:00	06/15/2019 06:59:00	60	Automatic Calibration	Performed necessary
	SO2	SV 051	06/15/2019 07:00:00	06/15/2019 07:59:00	60	Primary Analyzer Malfunction	maintenance Performed necessary
ine 2	NOx	SV 051	04/03/2019 06:00:00	04/03/2019 06:59:00	60	Automatic Calibration	maintenance Performed necessary
ine 2	NOx	SV 051	05/11/2019 06:00:00	05/11/2019 06:59:00	60	Automatic Calibration	maintenance Performed necessary
ine 2		-	05/14/2019 16:00:00	05/14/2019 16:59:00	60	Primary Analyzer Malfunction	Performed necessary
_ine 2	NOx	SV 051	05/20/2019 06:00:00	05/20/2019 06:59:00	60	Automatic Calibration	maintenance Performed necessary
Line 2	NOx	SV 051	05/21/2019 06:00:00	05/20/2019 06:59:00	60	Automatic Calibration	Performed necessary
Line 2	NOx	\$V 051	05/25/2019 11:00:00	05/25/2019 12:59:00	120	Primary Analyzer Malfunction	maintenance Performed necessary
Line 2	NOx	SV 051	05/25/2019 14:00:00	05/25/2019 16:59:00	180	Primary Analyzer Malfunction	maintenance Performed necessary
Line 2	NOx	SV 051	06/05/2019 01:00:00	06/05/2019 01:59:00	60	Primary Analyzer Malfunction	maintenance Performed necessary
Line 2	NOx	SV 051	06/05/2019 06:00:00	06/05/2019 06:59:00		Automatic Calibration	maintenance Performed necessary
Line 2	NOx	SV 051	06/05/2019 08:00:00			Preventative Maintenance	maintenance Performed necessary
Line 2	NOx	SV 051	06/05/2019 11:00:00	06/05/2019 11:59:00		Primary Analyzer Malfunction	maintenance Performed necessary
Line 2	NOx	SV 051	06/12/2019 03:00:00	06/12/2019 03;59:00		Primary Analyzer Malfunction	maintenance Performed necessary
Line 2	NOx	SV 051		06/13/2019 02:59:00	<u></u>	Primary Analyzer Malfunction	maintenance Performed necessary
Line 2	NOx	SV 051	06/13/2019 01:00:00	06/13/2019 02:59:00		Primary Analyzer Malfunction	maintenance Performed necessary
Line 2	NOx	SV 051	06/14/2019 23:00:00	06/15/2019 00:59:00		Primary Analyzer Malfunction	maintenance Performed necessary
Line 2	NOx	SV 051	06/15/2019 02:00:00			Automatic Calibration	maintenance Performed necessary
Line 2	NOx	SV 051	06/15/2019 06:00:00	06/15/2019 06:59:00		O Primary Analyzer Malfunction	maintenance Performed necessary
Line 2	NOx	SV 051	06/15/2019 07:00:00	06/15/2019 07:59:00	61	Primary Analyzer Manuriculor	maintenance
	ļ						
	1		3i) To	i tal duration of downtime	: 50	hours	<u> </u>

Durat	ion of Ex	cess Emis	4) Duration of Excess Emissions: Provide the following information regarding each individual excess emission	following informati	ion regarding	each individ	lual excess er	mission	. · ·	2
4a)	4b)	4c)	4d)	4e)	41)	49)	_	4)	4])	4N)
mission Unit ID	Monitor ID	Emission Monitor ID Pollutant or Unit ID Number Parameter	Beginning Date and Time of EE	End Date and Time of EE	Limit and Averaging		Duration of Exempt EE	Total Duration	Cause of EE (clarifying comments)	Highest Duration of Total Cause of EE Corrective Action Taken Reading of Exempt EE Duration (clarifying comments) (clarifying comments)
Number		Monitored			Period	EE with Units	(include these	of All EE		
						(example: 5	entries as			
						lb/hr, etc)	part of 4i)			
SV051	CM001	NOX	N/A	N/A	N/A	N/A	0	0	N/A	N/A
SV051	CM005	s02	5/26/2019 3:00	5/26/2019 3:59	290 lb - 1Hr	338 lb/hr	0	_	EE occurred due to a large swing in SO2 emissions and the lime	Started second lime pump and increased pH setpoint to 8.0
									dosage did not keep up.	
				1			C		Later Total	Outston A Line
			4l) Cumulativ	4I) Cumulative Duration of Exempt Excess Emissions:	mpt Excess	: Emissions;	- -		4m) cumulative Total Duration	

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were

comments) Corrective (clarifying taken action Ϋ́ Ϋ́ ΚŽ Ϋ́ ٧X ₹ \mathbb{X} Ϋ́ Ϋ́ N/A Ν Ϋ́ Ϋ́Ν N/A ΑN ₹X XX Ϋ́ ¥ X protect plant equipment protect plant equipmen Bypass necessary to Reason for monitor bypass (clarifying comments) bypass (min) Duration of allowable monitor 98 5 9 48 68 241 40 32 S ∞ α 4 ന 4 7 S 4 α / during bypass Was P.C.E. operating period? Yes Duration of bypass monitor (min.) 5 241 16 48 32 89 36 6 Ŋ 4 ന 4 1 4 S ťΩ ∞ α 4/17/2019 3:16 4/5/2019 21:00 4/5/2019 21:16 4/5/2019 22:08 4/9/2019 23:43 4/11/2019 10:58 4/14/2019 4:24 4/14/2019 7:29 4/14/2019 11:10 4/14/2019 12:36 4/16/2019 22:07 4/3/2019 5:00 4/5/2019 12:05 4/5/2019 12:07 4/5/2019 22:12 4/3/2019 9:01 4/5/2019 20:22 4/5/2019 23:32 4/6/2019 2:41 End date and time of bypass 4/5/2019 12:05 4/5/2019 21:00 4/5/2019 22:10 4/11/2019 10:55 4/14/2019 4:20 4/14/2019 6:22 4/14/2019 10:35 4/14/2019 12:21 4/16/2019 22:00 4/17/2019 3:11 4/5/2019 20:17 4/5/2019 20:52 4/5/2019 22:44 4/6/2019 2:37 4/9/2019 23:11 4/3/2019 4:20 4/3/2019 5:00 4/5/2019 22:01 4/5/2019 12:01 Beginning Date and Time of **Bypass Period** Required to Required to NOx and SO2 Monitored NOx and NOx and NOx and NOx and NOx and NOx and Pollutant NOx and NOx and NOx and NOx and and Limit NOx and NOx and NOx and NOx and NOx and NO_x and NOx and NOx and **SO2** 802 **SO2 S02 S**02 **SO2** 802 **S02 S02 SO2 SO2 SO2** S02 **SO2 S**02 **SO2 S**02 **S02** Monitored Emission SV 051 Monitor ID Line 2 number Line 2

_										<u>, -</u>	₁	 ,~	 1		<u></u>	I			7		Т	
5j)	Corrective action	taken (clarifying comments)		N/A	A/N	N/A																
(15)	Reason for monitor bypass (clarifying	comments)	· · · · · · · · · · · · · · · · · · ·	Bypass necessary to protect plant equipment																		
5h)	Duration of allowable	monitor bypass (min)		3	2	0	30	54	52	10	178	140	2	23	237	91	85	186	5	208	45	313
5g)	Was P.C.E.	during bypass period?		Yes																		
51)	Duration of	·		ო	2	6	30	54	52	10	178	140	2	23	237	91	85	186	ည	208	45	313
(eg	End date and time of bypass	ה ה ה ה ה ה ה ה ה ה ה ה ה ה ה ה ה ה ה		4/19/2019 21:17	4/19/2019 21:19	4/21/2019 11:47	4/23/2019 5:00	4/23/2019 5:54	4/23/2019 10:16	4/25/2019 12:02	4/25/2019 16:08	4/25/2019 18:40	4/25/2019 18:42	4/26/2019 6:25	4/27/2019 2:59	5/9/2019 5:30	5/10/2019 13:00	5/10/2019 16:06	5/10/2019 16:25	5/10/2019 20:13	5/10/2019 21:00	
5d)	Beginning Date and Time of	bypass Peliou		4/19/2019 21:14	4/19/2019 21:17	4/21/2019 11:39	4/23/2019 4:30	4/23/2019 5:00	4/23/2019 9:24	4/25/2019 11:52	4/25/2019 13:10	4/25/2019 16:20	4/25/2019 18:40	4/26/2019 6:03	4/26/2019 23:02	5/9/2019 3:59	5/10/2019 11:35	5/10/2019 13:00	5/10/2019 16:20	5/10/2019 16:45	5/10/2019 20:15	5/10/2019 21:00
5c)	Pollutant	and Limit Required to be	Monitored	NOx and SO2	NOx and	NOx and	NOx and SO2															
5b)	Emission		Wonttored	SV 051																		
5a)	Monitor ID	number		Line 2																		

																		г	 ,			
5j)	Corrective action	taken (clarifying		N/A																		
}	Reason for monitor bypass (clarifying		-	Bypass necessary to protect plant equipment																		
5h)	Duration of allowable	monitor bypass (min)		166	352	128	7	54	45	20	75	58	143	2	83	328	39	134	13	7	4	20
5g)	Was P.C.E.	during bypass period?		Yes																		
5f)	Duration of monitor			166	352	128		54	45	20	75	58	143	2	83	328	36	134	13		4	20
5e)	End date and time of bypass			5/11/2019 5:00	5/11/2019 10:52	5/11/2019 13:00	5/11/2019 13:07	5/11/2019 15:16	5/11/2019 17:52	5/11/2019 19:43	5/11/2019 21:00	5/11/2019 21:58	5/12/2019 3:10	5/12/2019 3:12	5/13/2019 20:53	5/14/2019 5:00	5/14/2019 5:39	5/15/2019 11:29	5/15/2019 12:46	5/16/2019 3:08	5/16/2019 3:13	5/18/2019 13:43
2d)	Beginning Date and Time of	D C C C C C C C C C C C C C C C C C C C		5/11/2019 2:14	5/11/2019 5:00	5/11/2019 10:52	5/11/2019 13:00	5/11/2019 14:21	5/11/2019 17:07	5/11/2019 19:23	5/11/2019 19:45	5/11/2019 21:00	5/12/2019 0:48	5/12/2019 3.11	5/13/2019 19:31	5/13/2019 23:32	5/14/2019 5:00	5/15/2019 9:15	5/15/2019 12:34	5/16/2019 3:01	5/16/2019 3:09	5/18/2019 13:23
5c)	Pollutant	Required to	Monitored	NOx and SO2	NOx and	NOx and SO2																
5b)	Emission		Monitored	SV 051																		
5a)	Monitor ID			Line 2	. Line 2	Line 2	Line 2	Line 2														

																				1
5j)	Corrective action taken (clarifying comments)	N/A																		
5i)	Reason for monitor bypass (clarifying comments)	Bypass necessary to protect plant equipment																		
5h)	Duration of allowable monitor bypass (min)	69	85	124	29	£.	308	31	43	112	28	198	480	က	13	44	7	1	15	116
5g)	Was P.C.E. operating during bypass period?	Yes																		
5f)	Duration of monitor bypass (min)	69	85	124	29	ഹ	308	31	43	112	28	198	480	ო	5	44	7	~	15	116
5e)	End date and time of bypass period	5/20/2019 5:00	5/20/2019 6:25	5/20/2019 8:29	5/20/2019 9.41	5/20/2019 13:00	5/20/2019 18:08	5/20/2019 19:55	5/20/2019 21:00	5/20/2019 22:52	5/20/2019 23:23	5/21/2019 5:00	5/21/2019 13:00	5/21/2019 13:03	5/21/2019 17:57	5/22/2019 12:00	6/2/2019 7:14	6/2/2019 7:22	6/2/2019 8:31	6/5/2019 4:28
5d)	Beginning Date and Time of Bypass Period	5/20/2019 3:51	5/20/2019 5:00	5/20/2019 6:25	5/20/2019 9:12	5/20/2019 12:55	5/20/2019 13:00	5/20/2019 19:24	5/20/2019 20:17	5/20/2019 21:00	5/20/2019 22:55	5/21/2019 1:42	5/21/2019 5:00	5/21/2019 13:00	5/21/2019 17:44	5/22/2019 11:17	6/2/2019 7:07	6/2/2019 7:21	6/2/2019 8:17	6/5/2019 2:32
5c)	Pollutant and Limit Required to be Monitored	NOx and SO2																		
5b)	on d to	SV 051																		
5a)	Monitor ID number	Line 2																		

5j)	Corrective action taken (clarifying comments)	N/A	A/N	A/N	N/A													
5i)	Reason for monitor bypass (clarifying comments)	Bypass necessary to protect plant equipment	houre	HOULS														
5h)	Duration of allowable monitor bypass (min)	135	1	28	3	125	81	17	17	114	18	2	4	133	10	132	407	JOI.
- 2g)	Was P.C.E. operating during bypass period?	Yes	sə,	Yes														
5f)	Duration of monitor bypass (min)	135	_	28	က	125	8	17	17	114	18	2	4	133	10	132	.000	pass:
5e)	End date and time of bypass period	6/5/2019 9:13	6/5/2019 9:15	6/5/2019 12:48	6/5/2019 12:51	6/14/2019 12:11	6/16/2019 1:59	6/16/2019 3:26	6/16/2019 5:23	6/19/2019 21:00	6/19/2019 21:18	6/20/2019 10:02	6/20/2019 10:06	6/20/2019 12:19	6/20/2019 20:14	6/21/2019 10:12	1 - 3 1 - 3 1 - 3	5k) Total duration of allowable monitor bypass:
5d)	Beginning Date and Time of Bypass Period	6/5/2019 6:58	6/5/2019 9:13	6/5/2019 12:20	6/5/2019 12:48	6/14/2019 10:06	6/16/2019 0:38	6/16/2019 3:09	6/16/2019 5:06	6/19/2019 19:06	6/19/2019 21:00	6/20/2019 10:01	6/20/2019 10:03	6/20/2019 10:07	6/20/2019 20:04	6/21/2019 8:00	1	5K) iotai di
5c)	an Red Mo	NOx and SO2																
5b)	on d to	SV 051																
5a)	Monitor ID number	Line 2																

6) CERTIFICATION

evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly for gathering the information, the information submitted is, to the best of my knowledge I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and and belief, true, accurate, and complete.

Susse D. Signature of Responsible Official enone &

Lawrence Sutherland Printed Name of Responsible Official

General Manager- Minnesota Ore Title

July 29, 2019

Date

udits	
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SS	
8	
A STATE OF	

	0.000			If act andit			Next test	
Subject item	hours	Monitor ID	Pollutant	date	Cal error results	Pass/fail	due by:	Comments
N/A						,		
	-							
Cylinder gas audit's (CGA)	audit's (C	GA)					-	
Emission unit	Operating hours	Monitor ID	Pollutant	Last audit date	Cal error results	Pass/fail	Next test due by:	Comments
1	1895	CM001	NOX	6/13/2019	Low 0.5% Mid 0.1% Pass	Pass	9/30/2019	
SV051/EU030	1895	CM005	802	6/13/2019	Low 3.6% Mid 3.1% Pass	Pass	9/30/2019	The state of the s
NAME OF TAXABLE PARTY O								
								Employee da 1922/2020/2020/2020/2020/2020/2020/2020/
Linearity								
Emission unit	Operating hours	Monitor ID	Pollutant	Last audit date	Cal error results	Pass/fail	Next test due by:	Comments
W/Z					Low Mid High			
Relative accuracy test audit (RATA)	curacy test	: audit (RAT	[A)					
Emission unit	Operating hours	Monitor ID	Pollutant	Last audit date	Relative accuracy	Pass/fail	Next test due by:	Comments
SV051		CM001	×ON	3/19/2019	9.4%	Pass	3/31/2020	
SV051		CM005	802	3/19/2019	6.4%	Pass	3/31/2020	

CGA Test Report

Facility Name: US Steel KeeTac

Location: ,

SO2 WGS Audit Test Results

Mfr. & Model: AMETEK 920 SO2 NOX

Serial Number: AE-920-10086-1

Test Date: 6/13/2019

Tester: NICHOLAS

WILSON

Analyzer Span: 250.000 PPMW

	Low	Mid
Reference Target	20 - 30% of Span	50 - 60% of Span
Range	(50.000 PPMW - 75.000 PPMW)	(125.000 PPMW - 150.000 PPMW)
Concentration	62.600	141.400
Cylinder No	CC168937	SG9169308BAL
Expiration Date	11/8/2020	10/22/2020

	Lo	w	M	id
	Time	Monitor Valuë	Time	Monitor Value
Run 1	09:05	61.000	09:08	137.000
Run 2	10:08	60.000	10:11	137.000
Run 3	11:08	60.000	11:11	137.000
Avg Monitor Response	<u> </u>	60,333		137.000
Calibration Error		3,62		3.11
Absolute Diff	A CONTRACTOR OF THE PARTY OF TH	2.267		4,400
Test Status		PASSED		PASSED

Calibration Error = _	Avg. Monitor Response - Cal. Gas Concentration	X 100
Odlibiation Error =	Cal. Gas Concentration	

Acceptable results for a successful CGA Audit are +/- 15% average audit value or +/- 5 PPM, whichever is greater.

CGA Test Report

Facility Name: US Steel KeeTac

Location: ,

NOX WGS Audit Test Results

Mfr. & Model: AMETEK 920 SO2 NOX

Serial Number: AE-920-10086-1

Test Date: 6/13/2019

Tester: NICHOLAS WILSON

Analyzer Span: 600.000 PPMW

	Low	Mid
Reference Target	20 - 30% of Span	50 - 60% of Span
Range	(120.000 PPMW - 180.000 PPMW)	(300.000 PPMW - 360.000 PPMW)
Concentration	130.000	324.000
Cylinder No	CC422243	CC322615
Expiration Date	2/24/2021	8/30/2024 ,

	Lo)W.	M	id
	Time	Monitor Value	Time	Monitor Value
Run 1	09:14	130.000	09:17	324.000
Run 2	10:17	131,000	10:20	324.000
Run 3	11:17	131,000	- 11:20	325.000
Avg Monitor Response		130,667		324.333
Calibration Error		0.51		0.10
Absolute Diff		0.667		0.333
Test Status .		PASSED		PASSED

	. Monitor Response - Cal. Gas Concentration	V 400
Calibration Error =	Cal. Gas Concentration	X 100

Acceptable results for a successful CGA Audit are +/- 15% average audit value or +/- 5 PPM, whichever is greater.

Summary Table by Monitor Downtime Type U. S. Steel - Keetac 2nd Quarter 2019

NOx

Line	Duration (Hrs)	Description
Line 2	6	Automatic Calibration
	0	Data Handling System Malfunction
	0	Sample Interface Malfunction
	0	Excess Drift Primary Analyzer
	18	Primary Analyzer Malfunction
	1	Preventative Maintenance

SO2

Line	Duration (Hrs)	Description
Line 2	6	Automatic Calibration
	0	Data Handling System Malfunction
	0	Sample Interface Malfunction
	0	Excess Drift Primary Analyzer
	18	Primary Analyzer Malfunction
	1	Preventative Maintenance



CERTIFIED MAIL 7018 3090 0001 9999 0153

July 29, 2019

Air Quality Compliance Tracking Coordinator Minnesota Pollution Control Agency 520 Lafayette Road North St. Paul, MN 55155-4194

Re:

United States Steel Corporation, Minnesota Ore Operations – Minntac Air Emissions Permit No. 13700005-006

Quarterly Continuous Monitoring System Deviation Report

Dear Supervisor:

Enclosed with this letter is U. S. Steel – Minntac's (Minntac) Quarterly Excess Emissions Reporting Form for the 2^{nd} quarter of 2019. NOx/SO₂ Continuous Emission Monitoring Systems (CEMS) are certified on all Agglomerator Waste Gas Lines.

Deviations associated with Emission Limits

There were no deviations during the 2nd quarter of 2019.

Deviations associated with Monitor Downtime

There were 79 instances of monitor downtime for either NOx or SO₂. The individual downtime durations and causes are listed in the monitor downtime section of this report.

Deviations associated with Monitor Bypass

Minntac utilizes a grate/kiln system for pelletizing taconite. Although this is an extremely hot process (with temperatures exceed 2500°F in the kiln), the equipment is designed to withstand the high temperatures and will do so during normal operation. However, the grate is very susceptible to heat damage during upset conditions or if stopped for any reason while it is hot. To prevent equipment damage and heat related safety issues during these situations, large amounts of heat must be released from the grate as soon as possible. For that reason the system was designed such that when the grate stops or gets overheated, a stack cap is lifted to release heat through an emergency stack. At this time the monitor is bypassed. These situations are the only times the monitor is bypassed. Because they represent upset conditions or process downtime (production loss), the company has a strong vested interest in minimizing both the number and duration of occurrences.

The times listed in the monitor bypass section are when the grate emergency stack cap is open and there is combustion in the kiln. This is the only time when any NO_x or SO_2 is emitted. Times when the cap is open but there is no combustion in the kiln are not listed.

If you have any questions concerning these forms, please contact Stephani Campbell at (218) 778-8684.

Sincerely,

Lawrence Sutherland

General Manager – Minnesota Ore Operations

Enclosure

cc: Steve Palzkill – MPCA

File



520 Lafayette Road North St. Paul, MN 55155-4194

Excess Emissions Reporting Form

Air Quality Permit Program Doc Type: Excess Emission Report

Note: Please complete, and remit only the forms. Please see the instructions to ensure proper use and understanding of definitions.

Do not print and return the instructions.

General Information about Deviation and Compliance Reporting

If your permit requires you to submit deviation reports or an annual compliance certification, you should use the Deviation Reporting Forms (DRFs) and Annual Compliance Certification Report (CR-04), unless you get Minnesota Pollution Control Agency (MPCA) approval to use another format or your facility's permit specifies otherwise. There are two separate DRF forms: DRF-1 and DRF-2.

DRF-1

is used to report direct excess stack emissions (EE) recorded by Continuous Emission Monitoring Systems (CEMS) and Continuous Opacity Monitoring Systems is used to report deviations recorded by periodic monitoring systems, deviations of permitted operating conditions and surrogate parameters whether recorded

DRF-2

Some examples: flow rate, temperature, throughput, control equipment operating parameters, fuel-use records

CR-04:

is used to report facility compliance status at the end of each year if required by your permit.

Address hard copy

Air Compliance Tracking Coordinator, Minnesota Pollution Control Agency

report submittals to:

520 Lafayette Road North, St. Paul, Minnesota 55155-4195

Or e-mail a signed and

AQRoutineReport.PCA@state.mn.us

scanned PDF copy to:

(see e-mail instructions in "Routine Air Report Instructions Letter" at:

http://www.pca.state.mn.us/nwqh472

1) General Facility Information

Facility name:

United States Steel Corporation, Minnesota Ore Operations, Minntac

AQ file no .: AQ permit#:

County:

St. Louis

Year:

13700005 2019

Report covers quarter: Second 2) CEMS/COMS Data Summary Table

	, odininar i			Duration of Downt		Dı	ıration of Ex	of Excess Emissions (EE)			
2a)	2b)	2c)	2d)	3i)	2e)	4l)	2f)	4m)	2g) Total EE % of		
Monitor ID Number	Monitor ID Pollutant	EU/SV ID Number	Total Operating Time (TOT)	Total Duration of Monitor Downtime (hr)	Downtime % Of TOT	Cumulative Duration of Exempt EE	Exempt EE % of TOT	Cumulative Total Duration of All EE	тот		
	NOv	SV-103	1828	1	0.1%	0	0%	0	0%		
MR 001	NOx		2106	2	0.1%	0	0%	0	0%		
MR 002	NOx	SV-118	2142	25	1.2%	0	0%	0	0%		
MR 003	NOx	SV-127			2.1%	0	0%	Ö	0%		
MR 004	NOx	SV-144	2094	45			0%	0	0%		
MR 005	NOx	SV-151	2090	17	0.8%	0		t ö	0%		
MR 001	SO2	SV-103	1828	11	0.1%	0	0%		0%		
MR 002	SO2	SV-118	2106	3	0.1%	0	0%	0			
	SO2	SV-127	2142	28	1.3%	0	0%	0	0%		
MR 003		SV-144	2094	46	2.2%	0	0%	00	0%		
MR 004	SO2		2090	16	0.8%	0	0%	0	0%		
MR 005	SO2	SV-151	2090	10	0.070	<u> </u>					

3) Duration of Monitor Downtime: Provide the following information regarding each period of monitor downtime. Make a separate table for each monitor, as needed.

	r, as needed	20)	3d)	3e)	3f)	3g)	3h)
3a) Ionitor ID Number	3b) Pollutant or parameter	3c) Emission Unit Being Monitored	Beginning Date and Time of Downtime	End Date and Time of Downtime	Duration of Downtime (minutes)	Reason for Monitor Downtime (clarifying comments)	Corrective ActionTaken (clarifying comments)
Y : 2	monitored NOx	SV103	05/11/2019 05:00:00	05/11/2019 05:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 3 Line 3	SO2	SV103	05/11/2019 05:00:00	05/11/2019 05:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 4	NOx	SV118	04/13/2019 06:00:00	04/13/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 4	NOx	SV118	05/22/2019 06:00:00	05/22/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 4	SO2	SV118	04/13/2019 06:00:00	04/13/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 4	SO2	SV118	05/14/2019 06:00:00	05/14/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 4	SO2	SV118	05/22/2019 06:00:00	05/22/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	NOx	SV127	04/10/2019 06:00:00	04/10/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	NOx	SV127	05/17/2019 13:00:00	05/17/2019 14:59:00	120	Primary Analyzer Malfunction	Performed necessary maintenance
Line 5	NOx	SV127	06/19/2019 17:00:00	06/20/2019 05:59:00	780	Primary Analyzer Malfunction	Performed necessary maintenance
Line 5	NOx	SV127	06/20/2019 06:00:00	06/20/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	NOx	SV127	06/20/2019 07:00:00	06/20/2019 07:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
Line 5	NOx	SV127	06/21/2019 02:00:00	06/21/2019 05:59:00	240	Secondary Analyzer Malfunction	Performed necessary maintenance
Line 5	NOx	SV127	06/21/2019 06:00:00	06/21/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	NOx	SV127	06/21/2019 07:00:00	06/21/2019 07:59:00	60	Secondary Analyzer Malfunction	Performed necessary maintenance
Line 5	NOx	SV127	06/24/2019 06:00:00	06/24/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	SO2	SV127	04/10/2019 06:00:00	04/10/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line 5	SO2	SV127	05/17/2019 13:00:00	05/17/2019 14:59:00	120	Primary Analyzer Malfunction	Performed necessar maintenance
Line 5	 	SV127	05/18/2019 06:00:00	05/18/2019 06:59:00	60	Automatic Calibration	THEOTER
Line 5		SV127	05/18/2019 07:00:00	05/18/2019 07:59:00	60	Excess Drift Primary Analyzer	Performed necessar maintenance
Line 5		SV127	05/18/2019 08:00:00	05/18/2019 08:59:00	60	Automatic Calibration	(High Horses in)
Line 5		SV127	06/19/2019 17:00:00	06/20/2019 05:59:00	780	Primary Analyzer Malfunction	Performed necessal maintenance Performed necessal
Line 5		SV127	06/20/2019 06:00:00	06/20/2019 06:59:00	60	Automatic Calibration	maintenance Performed necessar
Line 5		SV127	06/20/2019 07:00:00	06/20/2019 07:59:00	60	Primary Analyzer Malfunction	maintenance
Line 5		SV127	06/21/2019 02:00:00	06/21/2019 05:59:00	240	Secondary Analyzer Malfunction	maintenance Performed necessa
Line 5	s SO2	SV127	06/21/2019 06:00:00	06/21/2019 06:59:00	60	Automatic Calibration Secondary Analyzer	n maintenance
Line 5	SO2	SV127	06/21/2019 07:00:00	06/21/2019 07:59:00	60	Malfunction	maintenance
Line (5 SO2	SV127	06/24/2019 06:00:00	06/24/2019 06:59:00	60	Automatic Calibration	maintenance Performed necessa
Line (3 NOx	SV144	04/04/2019 06:00:00	04/04/2019 06:59:00	60	Automatic Calibratio Primary Analyzer	n maintenance Performed necessa
Line	6 NOx	SV144	04/10/2019 11:00:00	04/10/2019 16:59:00		Malfunction	maintenance Performed necessa
Line	6 NOx	SV144	04/10/2019 17:00:00	04/10/2019 17:59:00	60	Automatic Calibratio	n maintenance

3) Duration of Monitor Downtime: Provide the following information regarding each period of monitor downtime. Make a separate table for each monitor, as needed.

each monite	or, as needed					0+)	3h)
3a)	3b)	3c)	3d)	3e)	3f) Duration of	3g) Reason for Monitor	Corrective ActionTaken
Monitor ID	Pollutant or	Emission Unit Beina	Beginning Date and Time of Downtime	End Date and Time of Downtime	Duration of Downtime	Downtime	(clarifying comments)
Number	parameter monitored	Monitored	Title of Downline	Downing	(minutes)	(clarifying comments)	(4.4)
	monitored	Monitored			<u> </u>	Primary Analyzer	Performed necessary
Line 6	NOx	SV144	04/10/2019 18:00:00	04/11/2019 05:59:00	720	Malfunction	maintenance
110	NO.	SV144	04/11/2019 06:00:00	04/11/2019 06:59:00	60	Automatic Calibration	Performed necessary
Line 6	NOx	37144	04/11/2019 00:00:00	04/11/2010 00:00:00		Primary Analyzer	maintenance Performed necessary
Line 6	NOx	SV144	04/11/2019 07:00:00	04/11/2019 12:59:00	360	Malfunction	maintenance
			0.44449040, 40,00,00	04/44/0040 40-00.00	60	Automatic Calibration	Performed necessary
Line 6	NOx	SV144	04/11/2019 13:00:00	04/11/2019 13:59:00	80		maintenance
Line 6	NOx	SV144	05/08/2019 19:00:00	05/08/2019 21:59:00	180	Primary Analyzer Malfunction	Performed necessary maintenance
-						Secondary Analyzer	Performed necessary
Line 6	NOx	SV144	05/29/2019 10:00:00	05/29/2019 14:59:00	300	Malfunction	maintenance
Line 6	NOx	SV144	06/13/2019 06:00:00	06/13/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
Line o	NOX	0,111	00,10,2010 00,000				Performed necessary
Line 6	NOx	SV144	06/14/2019 06:00:00	06/14/2019 06:59:00	60	Automatic Calibration	maintenance
line 0	NOv	SV144	06/24/2019 07:00:00	06/24/2019 08:59:00	120	Primary Analyzer	Performed necessary
Line 6	NOx	SV 144	00/24/2019 07:00:00	00/24/2019 00:55:00		Malfunction	maintenance Performed necessary
Line 6	NOx	SV144	06/25/2019 06:00:00	06/25/2019 06:59:00	60	Automatic Calibration	maintenance
			***************************************	00/07/00/0 00:50:00		Automatic Calibration	Performed necessary
Line 6	NOx	SV144	06/27/2019 06:00:00	06/27/2019 06:59:00	60		maintenance
Line 6	NOx	SV144	06/29/2019 13:00:00	06/29/2019 15:59:00	180	Secondary Analyzer	Performed necessary maintenance
	HOX.					Malfunction	Performed necessary
Line 6	SO2	SV144	04/04/2019 06:00:00	04/04/2019 06:59:00	60	Automatic Calibration	maintenance
Line 6	SO2	SV144	04/10/2019 11:00:00	04/10/2019 16:59:00	360	Primary Analyzer	Performed necessary
Title 0	302	37144	04/10/2019 11:00:00	04/10/2010 10:00:00		Malfunction	maintenance Performed necessary
Line 6	SO2	SV144	04/10/2019 17:00:00	04/10/2019 17:59:00	60	Automatic Calibration	maintenance
	000	0) (4.4.4	0.4(40)0040, 40,00,00	04/11/2019 05:59:00	720	Primary Analyzer	Performed necessary
Line 6	SO2	SV144	04/10/2019 18:00:00	04/11/2019 05.59.00	720	Malfunction	maintenance
Line 6	SO2	SV144	04/11/2019 06:00:00	04/11/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
				0.111.1/00.10 10.50.00	200	Primary Analyzer	Performed necessary
Line 6	SO2	SV144	04/11/2019 07:00:00	04/11/2019 12:59:00	360	Malfunction	maintenance
Line 6	SO2	SV144	04/11/2019 13:00:00	04/11/2019 13:59:00	60	Automatic Calibration	Performed necessary maintenance
		 					Performed necessary
Line 6	SO2	SV144	05/21/2019 06:00:00	05/21/2019 06:59:00	60	Automatic Calibration	maintenance
Line 6	SO2	SV144	05/21/2019 07:00:00	05/21/2019 07:59:00	60	Excess Drift Primary	Performed necessary
Line	302	00177	00/21/2010 01:00:00	V	****	Analyzer	maintenance Performed necessary
Line 6	SO2	SV144	05/21/2019 08:00:00	05/21/2019 08:59:00	60	Automatic Calibration	maintenance
Line 6	SO2	SV144	05/29/2019 09:00:00	05/29/2019 09:59:00	60	Sample Interface	Performed necessary
Line			00/10/10/0		 	Malfunction Secondary Analyzer	maintenance Performed necessary
Line 6	SO2	SV144	05/29/2019 10:00:00	05/29/2019 14:59:00	300	Malfunction	maintenance
		0)/4.4.4	06/13/2019 06:00:00	06/13/2019 06:59:00	60	Automatic Calibration	Performed necessary
Line 6	SO2	SV144	06/13/2019 06:00:00	06/13/2019 00.59.00	00	Additiate Calibration	maintenance Performed necessary
Line 6	SO2	SV144	06/14/2019 06:00:00	06/14/2019 06:59:00	60	Automatic Calibration	maintenance
				00/04/0040 00 50 00	400	Primary Analyzer	Performed necessary
Line 6	SO2	SV144	06/24/2019 07:00:00	06/24/2019 08:59:00	120	Malfunction	maintenance
Line 6	SO2	SV144	06/25/2019 06:00:00	06/25/2019 06:59:00	60	Automatic Calibration	Performed necessary maintenance
				<u></u>			Performed necessary
Line 6	SO2	SV144	06/27/2019 06:00:00	06/27/2019 06:59:00	60	Automatic Calibration	maintenance
	500	SV144	06/29/2019 13:00:00	06/29/2019 15:59:00	180	Secondary Analyzer	Performed necessary
Line 6	SO2	37144	00/20/2010 10:00:00	0012012010 10,00.00	1.00	Malfunction	maintenance Performed necessary
Line 7	NOx	SV151	04/26/2019 06:00:00	04/26/2019 06:59:00	60	Automatic Calibration	maintenance
·T***	<u></u>		05/00/0040 04.00.00	05/00/0040 04-50-00	60	Automatic Calibration	Performed necessary
Line 7	NOx	SV151	05/03/2019 04:00:00	05/03/2019 04:59:00	1 00	l	maintenance
Line 7	NOx	SV151	05/03/2019 05:00:00	05/03/2019 05:59:00	60	Primary Analyzer Malfunction	Performed necessary maintenance
	ļ	 	***				Performed necessary
Line 7	NOx	SV151	05/03/2019 07:00:00	05/03/2019 07:59:00	60	Automatic Calibration	maintenance
Line 7	NOx	SV151	05/29/2019 10:00:00	05/29/2019 14:59:00	300	Secondary Analyzer	Performed necessary
Lille /	1 1100		1 20,20,20 10,000,00			Malfunction	maintenance

3) Duration of Monitor Downtime: Provide the following information regarding each period of monitor downtime. Make a separate table for

each monitor, as needed. 3f) 3g) 3e) 3c) 3d) 3a) 3b) Corrective ActionTaken Reason for Monitor Duration of End Date and Time of Beginning Date and (clarifying comments) Emission Pollutant or Monitor ID Downtime Downtime Time of Downtime Downtime parameter Unit Being Number (clarifying comments) (minutes) Monitored monitored Performed necessary Automatic Calibration 05/30/2019 07:59:00 60 maintenance 05/30/2019 07:00:00 SV151 NOx Line 7 Performed necessary Automatic Calibration 120 06/14/2019 07:59:00 maintenance 06/14/2019 06:00:00 SV151 NOx Line 7 Performed necessary Automatic Calibration 120 06/18/2019 06:00:00 06/18/2019 07:59:00 maintenance SV151 NOx Line 7 Secondary Analyzer Performed necessary 06/29/2019 15:59:00 180 06/29/2019 13:00:00 Malfunction maintenance NOx SV151 Line 7 Performed necessary Automatic Calibration 60 04/26/2019 06:59:00 maintenance 04/26/2019 06:00:00 SV151 SO2 Line 7 Performed necessary Automatic Calibration 60 05/03/2019 04:59:00 maintenance 05/03/2019 04:00:00 SV151 SO2 Line 7 Performed necessary Primary Analyzer 60 05/03/2019 05:59:00 maintenance 05/03/2019 05:00:00 Malfunction SV151 Line 7 SO2 Performed necessary Automatic Calibration 60 05/03/2019 07:59:00 maintenance 05/03/2019 07:00:00 SV151 Line 7 SO₂ Performed necessary Secondary Analyzer 300 05/29/2019 14:59:00 05/29/2019 10:00:00 maintenance Malfunction SO2 SV151 Line 7 Performed necessary **Automatic Calibration** 05/30/2019 07:59:00 60 maintenance 05/30/2019 07:00:00 SV151 SO2 Line 7 Performed necessary Automatic Calibration 06/14/2019 07:59:00 120 maintenance 06/14/2019 06:00:00 SV151 SO₂ Line 7 Performed necessary Automatic Calibration 06/18/2019 07:59:00 60 maintenance 06/18/2019 07:00:00 SV151 SO₂ Line 7 Performed necessary Secondary Analyzer 180 06/29/2019 15:59:00 maintenance 06/29/2019 13:00:00 Malfunction SV151 SO₂ Line 7 hours 3i) Total duration of downtime: 184

4) Duration of Excess Emissions: Provide the following information regarding each individual excess emission identified by a monitor. Make a separate table for each monitor, as needed.

emission ide	entified by a	monitor. Mal	ke a separate	table for ea	CH HOMO, E	4a)	4h)	4i)	4[)	4k)
4a)	4b)	4c)	4d)	4e)	4f)	4g)			Cause of EE	Corrective Action
Emission Unit ID Number	Monitor ID Number	Pollutant or Parameter Monitored	Beginning Date and Time of EE	End Date and Time of EE	Limit and Averaging Period	Highest Reading of EE with Units (example: 5 lb/hr, etc)	Duration of Exempt EE (include these entries as part of 4i)	Duration of All EE		Taken (clarifying comments)
			51/4	N/A	N/A	N/A	0	0	N/A	N/A
SV-103	MR 001	Nox/SO2	N/A			N/A	0	0	N/A	N/A
SV-118	MR 002	Nox/SO2	N/A	N/A	N/A			0	N/A	N/A
SV-127	MR 003	Nox/SO2	N/A	N/A	N/A	N/A	0	<u> </u>		N/A
	MR 004	Nox/SO2	N/A	N/A	N/A	N/A	0	0	N/A	
SV-144				N/A	N/A	N/A	0	0	N/A	N/A
SV-151	MR 005	Nox/SO2 4I) Cu	N/A mulative Du			Emissions:		0	4m) Cumula	tive Total ^O

5) Monitor Bypasses: Provide the following Information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system See Minn. R. 7017.1110 subp. 2c

5a)	5b)	5c)	5d)	5e)	5f)	5g)	5h)	5i)	5j) Corrective
Monitor ID number	Emission Unit Required to be Monitored	Pollutant and Limit Required to be Monitored	Beginning Date and Time of Bypass Period	End date and time of bypass period	Duration of monitor bypass (minutes)	Was P.C.E. operating during bypass period?	Duration of allowable monitor bypass	Reason for monitor bypass (clarifying comments)	action taken (clarifying comments)
Line 3	SV103	NOx/SO2	4/15/19 12:59	4/15/19 14:30	91	YES	91	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/15/19 14:30	4/15/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/15/19 19:00	4/15/19 22:30	210	YES	210	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/15/19 22:30	4/16/19 0:59	149	YES	149	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/16/19 8:59	4/16/19 14:30	331	YES	331	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/16/19 14:30	4/16/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/16/19 19:00	4/16/19 22:30	210	YES	210	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/16/19 22:30	4/17/19 5:57	447	YES	447	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/17/19 6:47	4/17/19 7:00	13	YES	13	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/17/19 7:00	4/17/19 10:25	205	YES	205	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/17/19 11:31	4/17/19 12:50	79	YES	79	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/17/19 14:48	4/17/19 16:58	130	YES	130	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/20/19 8:21	4/20/19 10:35	134	YES	134	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/26/19 7:55	4/26/19 9:25	91	YES	91	Bypass necessary t protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	4/26/19 17:36	4/26/19 18:01	25	YES	25	Bypass necessary t protect plant equipment.	o N/A
Line 3	3 SV103	NOx/SO2	4/29/19 15:48	4/29/19 15:55) 11	YES	11	Bypass necessary to protect plant equipment.	N/A
Line 1	3 SV103	NOx/SO2	4/29/19 16:03	3 4/29/19 16:1:	3 10	YES	10	Bypass necessary protect plant equipment.	N/A
Line	3 SV103	NOx/SO2	4/29/19 16:4:	4/29/19 16:4	7 5	YES	5	Bypass necessary protect plant equipment.	to N/A
Line	3 SV103	NOx/SO2	5/2/19 9:10	5/2/19 12:48	3 218	YES	218	Bypass necessary protect plant equipment.	to N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system See Minn. R. 7017.1110 subp. 2c

	5b)	5c)	erted around the m	5e)	5f)	5g)		5i)	5j) Corrective
5a) Ionitor ID	Emission Unit Required to be	Pollutant and Limit Required	Beginning Date and Time of	End date and time of bypass period	Duration of monitor bypass	Was P.C.E. operating during bypass	Duration of allowable monitor bypass	Reason for monitor bypass (clarifying comments)	action taken (clarifying comments)
number Line 3	Monitored SV103	to be Monitored NOx/SO2	Bypass Period 5/2/19 19:58	5/2/19 21:48	(minutes)	period? YES	110	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	5/7/19 3:36	5/7/19 3:37	2	YES	2	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	5/11/19 2:13	5/11/19 6:30	257	YES	257	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	5/11/19 6:30	5/11/19 7:00	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	5/26/19 8:54	5/26/19 9:02	7	YES	7	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	6/4/19 10:25	6/4/19 11:50	84	YES	84	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	6/4/19 13:17	6/4/19 14:07	50	YES	50	Bypass necessary to protect plant equipment.	N/A
Line 3	SV103	NOx/SO2	6/9/19 2:19	6/9/19 2:58	39	YES	39	Bypass necessary to protect plant equipment.	N/A
Line 3		NOx/SO2	6/18/19 13:38	6/18/19 14:30	52	YES	52.	Bypass necessary to protect plant equipment.	N/A
Line 3		NOx/SO2	6/18/19 14:30	6/18/19 18:27	237	YES	237	Bypass necessary to protect plant equipment.	N/A
Line 3		NOx/SO2	6/27/19 3:15	6/27/19 3:33	18	YES	18	Bypass necessary to protect plant equipment.	N/A
Line 4	<u> </u>	NOx/SO2	4/6/19 7:41	4/6/19 9:44	123	YES	123	Bypass necessary t protect plant equipment.	N/A
Line		NOx/SO2	4/6/19 10:35	4/6/19 10:47	12	YES	12	Bypass necessary to protect plant equipment.	N/A
Line		NOx/SO2	4/10/19 8:21	4/10/19 8:35	14	YES	14	Bypass necessary protect plant equipment.	N/A
Line		NOx/SO2	4/11/19 12:5	4 4/11/19 13:5	9 65	YES	65	Bypass necessary protect plant equipment.	N/A
Line		NOx/SO2	4/12/19 9:5	9 4/12/19 14:3	0 271	YES	271	Bypass necessary protect plant equipment.	N/A
Line	4 SV118	NOx/SO2	2 4/12/19 14:3	0 4/12/19 19:0	00 270	YES	270	Bypass necessary protect plant equipment.	N/A
Line	4 SV118	NOx/SO2	2 4/12/19 19:0	00 4/12/19 22:3	30 210	YES	210	Bypass necessary protect plant equipment.	N/A
Line	e 4 SV118	NOx/SO	2 4/12/19 22:	30 4/13/19 6:3	30 480	YES	480	Bypass necessary protect plant equipment.	v to N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system See Minn. R. 7017.1110 subp. 2c

5a)	5b)	5c)	5d)	5e)	5f)	5g)	5h) Duration of	5i)	5j) Corrective
onitor ID umber	Emission Unit Required to be Monitored	Pollutant and Limit Required to be Monitored	Beginning Date and Time of Bypass Period	End date and time of bypass period	Duration of monitor bypass (minutes)	Was P.C.E. operating during bypass period?	allowable monitor bypass	bypass (clarifying comments)	action taken (clarifying comments)
Line 4	SV118	NOx/SO2	4/13/19 6:30	4/13/19 7:00	30	YES	30	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/13/19 7:00	4/13/19 9:30	151	YES	151	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/22/19 8:21	4/22/19 11:47	206	YES	206	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/30/19 22:28	4/30/19 22:30	2	YES	2	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	4/30/19 22:30	4/30/19 22:59	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/1/19 9:59	5/1/19 14:30	271	YES	271	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/1/19 14:30	5/1/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/1/19 19:00	5/1/19 22:30	211	YES	211	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/1/19 22:30	5/1/19 23:43	73	YES	73	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/2/19 0:25	5/2/19 1:05	39	YES	39	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/2/19 1:19	5/2/19 2:00	41	YES	41	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/2/19 2:25	5/2/19 3:05	40	YES	40	Bypass necessary to protect plant equipment.	N/A
Line 4	SVII8	NOx/SO2	5/2/19 3:51	5/2/19 4:24	33	YES	33	Bypass necessary to protect plant equipment.	N/A
Line 4	4 SV118	NOx/SO2	5/3/19 12:49	5/3/19 13:42	2 53	YES	53	Bypass necessary t protect plant equipment.	N/A
Line 4	4 SV118	NOx/SO2	5/4/19 9:29	5/4/19 11:2	3 114	YES	114	Bypass necessary to protect plant equipment.	N/A
Line	4 SV118	NOx/SO2	5/4/19 11:31	7 5/4/19 12:4	7 70	YES	70	Bypass necessary protect plant equipment.	N/A
Line	4 SV118	NOx/SO2	5/4/19 12:50	5/4/19 13:4	2 53	YES	53	Bypass necessary protect plant equipment.	N/A
Line	4 SV118	NOx/SO2	5/6/19 13:5	1 5/6/19 14:0	6 15	YES	15	Bypass necessary protect plant equipment.	N/A
Line	4 SV118	NOx/SO2	2 5/6/19 16:3	7 5/6/19 17:0)4 26	YES	26	Bypass necessary protect plant equipment.	to N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system See Minn. R. 7017.1110 subp. 2c

5a)	5b)	5c)	5d)	5e)	5f)	5g)	5h)	5i)	5j)
Monitor ID number	Emission Unit Required to be Monitored	Pollutant and Limit Required to be Monitored	Beginning Date and Time of Bypass Period	End date and time of bypass period	Duration of monitor bypass (minutes)	Was P.C.E. operating during bypass period?	Duration of allowable monitor bypass	Reason for monitor bypass (clarifying comments)	Corrective action taken (clarifying comments)
Line 4	SV118	NOx/SO2	5/6/19 21:24	5/6/19 21:25	2	YES	2	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/6/19 21:47	5/6/19 21:51	4	YES	4	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/7/19 1:50	5/7/19 1:54	4	YES	4	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/7/19 4:55	5/7/19 5:59	64	YES	64	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/7/19 8:59	5/7/19 14:30	331	YES	331	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/7/19 14:30	5/7/19 14:58	28	YES	28	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/7/19 16:34	5/7/19 16:52	18	YES	18	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/18/19 10:10	5/18/19 12:48	159	YES	159	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/22/19 6:10	5/22/19 6:30	20	YES	20	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/22/19 6:30	5/22/19 7:00	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/22/19 7:00	5/22/19 10:47	227	YES	227	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/22/19 10:47	5/22/19 14:30	223	YES	223	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/22/19 14:30	5/22/19 14:32	2	YES	2	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/24/19 22:34	5/24/19 23:51	77	YES	77	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	5/30/19 9:57	5/30/19 10:32	35	YES	35	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/3/19 15:05	6/3/19 15:22	17	YES	17	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/4/19 10:25	6/4/19 11:06	41	YES	41	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/4/19 14:57	6/4/19 15:59	62	YES	62	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/6/19 11:59	6/6/19 14:30	151	YES	151	Bypass necessar to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system See Minn. R. 7017.1110 subp. 2c

5a)	5b)	5c)	5d)	5e)	5f) Duration of	5g) Was P.C.E.	5h) Duration of	5i)	5j) Corrective
Manitor ID number	Emission Unit Required to be Monitored	Pollutant and Limit Required to be Monitored	Beginning Date and Time of Bypass Period	End date and time of bypass period	monitor bypass (minutes)	operating during bypass period?	allowable monitor bypass	Reason for monitor bypass (clarifying comments)	action taken (clarifying comments)
Line 4	SV118	NOx/SO2	6/6/19 14:30	6/6/19 19:00	269	YES	269	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/6/19 19:00	6/7/19 6:07	668	YES	668	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/14/19 16:27	6/14/19 19:00	152	YES	152	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/14/19 19:00	6/14/19 21:04	125	YES	125	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/21/19 4:42	6/21/19 6:10	88	YES	88	Bypass necessary to protect plant equipment.	N/A
Line 4	SV118	NOx/SO2	6/24/19 15:19	6/24/19 15:38	19	YES	19	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/3/19 10:08	4/3/19 11:49	102	YES	102	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/5/19 8:00	4/5/19 9:02	62	YES	62	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/7/19 9:06	4/7/19 9:30	25	YES	25	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/7/19 22:28	4/7/19 22:30	1	YES	1	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/7/19 22:30	4/7/19 22:59	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/9/19 6:59	4/9/19 14:30	451	YES	451	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/9/19 14:30	4/9/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/9/19 19:00	4/9/19 22:30	210	YES	210	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/9/19 22:30	4/10/19 0:54	144	YES	144	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/10/19 1:16	4/10/19 3:09	113	YES	113	Bypass necessary to protect plant equipment.	N/A
Lìne 5	SV127	NOx/SO2	4/10/19 3:31	4/10/19 5:25	113	YES	113	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/10/19 5:49	4/10/19 6:30	41	YES	41	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/\$02	4/10/19 6:30	4/10/19 7:00	30	YES	30	Bypass necessary to protect plant equipment.	N/A
Line 5	5 SV127	NOx/SO2	4/10/19 7:00	4/10/19 7:52	53	YES	53	Bypass necessary to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system See Minn. R. 7017.1110 subp. 2c

5a)	5b)	5c)	erted around the n	5e)	5f)	5g)	5h)	5i)	5j)
Monitor ID number	Emission Unit Required to be Monitored	Pollutant and Limit Required to be Monitored	Beginning Date and Time of Bypass Period	End date and time of bypass period	Duration of monitor bypass (minutes)	Was P.C.E. operating during bypass period?	Duration of allowable monitor bypass	Reason for monitor bypass (clarifying comments)	Corrective action taken (clarifying comments)
Line 5	SV127	NOx/SO2	4/26/19 10:14	4/26/19 11:40	86	YES	86	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	4/29/19 7:59	4/29/19 9:10	. 71	YES	71	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/14/19 22:28	5/14/19 22:30	2	YES	2	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/14/19 22:30	5/14/19 22:59	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/15/19 8:59	5/15/19 14:30	331	YES	331	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/15/19 14:30	5/15/19 19:00	269	YES	269	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/15/19 19:00	5/15/19 20:44	105	YES	105	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/16/19 14:09	5/16/19 14:13	4	YES	4	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/17/19 5:11	5/17/19 6:21	70	YES	70	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/17/19 8:10	5/17/19 8:17	6	YES	6	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/18/19 16:15	5/18/19 16:18	3	YES	3	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/31/19 8:02	5/31/19 9:11	69	YES	69	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/31/19 10:26	5/31/19 11:02	. 36	YES	36	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/31/19 11:37	5/31/19 12:03	27	YES	27	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	5/31/19 13:12	5/31/19 14:03	52	YES	52	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/1/19 23:14	6/1/19 23:32	17	YES	17	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/3/19 10:00	6/3/19 13:06	186	YES	186	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/4/19 9:04	6/4/19 14:30	326	YES	326	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/4/19 14:30	6/4/19 16:36	126	YES	126	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/4/19 16:42	6/4/19 16:44	2	YES	2	Bypass necessary to protect plant equipment.	N/A

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5a)	5b)	5c)	5d)	5e)	5f)	5g)	5h)	5i)	5j)
Ja)					Duration of	Was P.C.E.	Duration of	Reason for monitor	Corrective
Jonitor	Emission Unit	Pollutant and	Beginning Date	End date and	monitor	operating	allowable	bypass (clarifying	action taker
ID	Required to be	Limit Required	and Time of	time of bypass	bypass	during bypass	monitor	comments)	(clarifying
umber	Monitored	to be Monitored	Bypass Period	period	(minutes)	period?	bypass	Comments	comments
Line 5	SV127	NOx/SO2	6/4/19 19:20	6/4/19 21:12	112	YES	112	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/7/19 8:03	6/7/19 9:28	85	YES	85	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/12/19 8:52	6/12/19 9:38	46	YES	46	Bypass necessary to protect plant equipment.	N/A
Line 5	\$V127	NOx/SO2	6/14/19 1:04	6/14/19 1:28	24	YES	24	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/14/19 1:45	6/14/19 2:06	21	YES	21	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/14/19 2:27	6/14/19 3:05	38	YES	38	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/14/19 19:05	6/14/19 21:27	141	YES	141	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/23/19 13:39	6/23/19 14:30	51	YES	51	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/23/19 14:30	6/23/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/23/19 19:00	6/23/19 19:52	52	YES	52	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/23/19 20:45	6/23/19 21:17	32	YES	32	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/24/19 5:47	6/24/19 6:30	43	YES	43	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/24/19 6:30	6/24/19 7:00	30	YES	30	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/24/19 7:00	6/24/19 10:14	195	YES	195	Bypass necessary to protect plant equipment.	N/A
Line 5	SV127	NOx/SO2	6/27/19 8:07	6/27/19 8:49	42	YES	42	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/4/19 2:21	4/4/19 4:26	126	YES	126	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/4/19 6:34	4/4/19 7:00	25	YES	25	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/4/19 7:00	4/4/19 9:29	150	YES	150	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/4/19 11:29	4/4/19 13:59	150	YES	150	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/25/19 19:29	4/25/19 19:33	3 4	YES	4	Bypass necessary to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system See Minn. R. 7017.1110 subp. 2c

5a)	5b)	5c)	5d)	5e)	5f)	5g)	5h)	5i)	5j)
Monitor ID	Emission Unit Required to be	Pollutant and Limit Required	Beginning Date and Time of	End date and time of bypass	Duration of monitor bypass	Was P.C.E. operating during bypass	Duration of allowable monitor	Reason for monitor bypass (clarifying	Corrective action taken (clarifying
number	Monitored	to be Monitored	Bypass Period	period	(minutes)	period?	bypass	comments)	comments)
Line 6	SV144	NOx/SO2	4/25/19 19:37	4/25/19 20:06	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/26/19 5:19	4/26/19 6:30	71	YES	71	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/26/19 6:30	4/26/19 6:34	4	YES	4	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/26/19 7:27	4/26/19 8:48	81	YES	81	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	4/29/19 17:08	4/29/19 17:50	43	YES	43	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/3/19 14:30	5/3/19 14:34	4	YES	4	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/7/19 22:30	5/7/19 22:59	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/8/19 10:59	5/8/19 14:30	221	YES	221	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/8/19 14:30	5/8/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/8/19 19:00	5/8/19 22:30	210	YES	210	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/8/19 22:30	5/8/19 23:32	62	YES	62	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/9/19 0:18	5/9/19 2:16	117	YES	117	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/9/19 2:19	5/9/19 4:43	144	YES	144	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/9/19 4:47	5/9/19 6:01	74	YES	74	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/10/19 7:27	5/10/19 7:44	17	YES	17	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/13/19 7:41	5/13/19 7:55	14	YES	14	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/22/19 20:06	5/22/19 20:11	5	YES	5	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/27/19 17:57	5/27/19 18:02	5	YES	5	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/28/19 0:42	5/28/19 0:48	6	YES	6	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	5/29/19 9:55	5/29/19 10:44	49	YES	49	Bypass necessary to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system See Minn. R. 7017.1110 subp. 2c

5a)	5b)	5c)	5d)	5e)	5f)	5g) Was P.C.E.	5h) Duration of	5i)	5j) Corrective
Monitor ID Iumber	Emission Unit Required to be Monitored	Pollutant and Limit Required to be Monitored	Beginning Date and Time of Bypass Period	End date and time of bypass period	Duration of monitor bypass (minutes)	operating during bypass period?	allowable monitor bypass	Reason for monitor bypass (clarifying comments)	action taken (clarifying comments)
Line 6	SV144	NOx/SO2	6/3/19 22:33	6/3/19 23:51	79	YES	79	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/4/19 5:07	6/4/19 6:13	66	YES	66	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/9/19 21:47	6/9/19 21:59	12	YES	12	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/13/19 3:59	6/13/19 6:30	151	YES	151	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/13/19 6:30	6/13/19 7:00	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/13/19 7:00	6/13/19 14:30	450	YES	450	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/13/19 14:30	6/13/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/13/19 19:00	6/13/19 22:30	210	YES	210	Bypass necessary to protect plant equipment. Bypass necessary	N/A
Line 6	SV144	NOx/SO2	6/13/19 22:30	6/14/19 6:30	480	YES	480	to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 6:30	6/14/19 7:00	30	YES	30	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 7:00	6/14/19 14:21	441	YES	441	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 14:39	6/14/19 14:49	9	YES	9	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 15:34	6/14/19 15:48	14	YES	14	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 16:19	6/14/19 16:20	1	YES	1	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 16:24	6/14/19 16:36	12	YES	12	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 20:09	6/14/19 22:30	141	YES	141	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/14/19 22:30	6/15/19 1:42	192	YES	192	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/25/19 6:49	6/25/19 7:00	11	YES	11	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/25/19 7:00	6/25/19 9:24	144	YES	144	Bypass necessar to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/26/19 22:41	6/26/19 23:5	1 70	YES	70	Bypass necessar to protect plant equipment.	N/A

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system See Minn. R. 7017.1110 subp. 2c

5a)	5b)	5c)	5d)	5e)	5f)	5g)	5h)	5i)	5j) Corrective
Monitor ID number	Emission Unit Required to be Monitored	Pollutant and Limit Required to be Monitored	Beginning Date and Time of Bypass Period	End date and time of bypass period	Duration of monitor bypass (minutes)	Was P.C.E. operating during bypass period?	Duration of allowable monitor bypass	Reason for monitor bypass (clarifying comments)	action taken (clarifying comments)
Line 6	SV144	NOx/SO2	6/27/19 2:00	6/27/19 3:14	74	YES	74	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/27/19 5:47	6/27/19 6:30	43	YES	43	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/27/19 6:30	6/27/19 7:00	30	YES	30	Bypass necessary to protect plant equipment.	N/A
Line 6	SV144	NOx/SO2	6/27/19 7:00	6/27/19 8:50	111	. YES	111	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/1/19 19:12	4/1/19 19:16	4	YES	4	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/4/19 20:55	4/4/19 21:01	6	YES	6	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/6/19 8:59	4/6/19 9:25	26	YES	26	Bypass necessary to protect plant equipment.	·N/A
Line 7	SV151	NOx/SO2	4/9/19 16:45	4/9/19 16:52	7	YES	7	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/9/19 19:45	4/9/19 20:02	17	YES	17	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/11/19 21:54	4/11/19 22:16	21	YES	21	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NÖx/SO2	4/15/19 21:49	4/15/19 21:53	5	YES	5	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/19/19 16:13	4/19/19 16:22	9	YES	9	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/23/19 22:30	4/23/19 22:59	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/24/19 9:59	4/24/19 14:30	271	YES	271	Bypass necessary to protect plant equipment.	· N/A
Line 7	SV151	NOx/SO2	4/24/19 14:30	4/24/19 19:00	270	YES	270	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/24/19 19:00	4/24/19 21:59	179	YES	179	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/26/19 5:22	4/26/19 6:30	68	YES	68	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/26/19 6:30	4/26/19 7:00	29	YES	29	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	4/26/19 7:00	4/26/19 7:47	48	YES	48	Bypass necessary to protect plant equipment.	N/A
Line 7	SV151	NOx/SO2	5/1/19 11:40	5/1/19 12:22	41	YES	41	Bypass necessary to protect plant equipment.	N/A

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<u>-</u> . T		 -	5d)	5e)	5f)	5g)	5h)	5i)	5j)
5a)	5b)	5c)	- July	Jej	Duration of	Was P.C.E.	Duration of	5	Corrective
Monitor	Emission Unit	Pollutant and	Beginning Date	End date and	monitor	operating	allowable	Reason for monitor	action taken
ID	Required to be	Limit Required	and Time of	time of bypass	bypass	during bypass	monitor	bypass (clarifying	(clarifying
number	Monitored	to be Monitored	Bypass Period	period	(minutes)	period?	bypass	comments)	comments)
Huanboi	10,0,000				(minutes)	period:	Бурасс	Bypass necessary	
<u> </u>			_,_,,	E/0/40 0:04		YES	4	to protect plant	N/A
Line 7	SV151	NOx/SO2	5/2/19 9:30	5/2/19 9:34	4	153	7	equipment.	
								<u> </u>	, ·
							40	Bypass necessary	N/A
Line 7	SV151	NOx/SO2	5/3/19 6:14	5/3/19 6:30	16	YES	16	to protect plant	18/75
					<u> </u>		<u> </u>	equipment.	 -
							1	Bypass necessary	1773
Line 7	SV151	NOx/SO2	5/3/19 6:30	5/3/19 7:00	30	YES	30	to protect plant	N/A
1 2							<u> </u>	equipment.	
							1	Bypass necessary	
Line 7	SV151	NOx/SO2	5/3/19 7:00	5/3/19 9:33	153	YES	153	to protect plant	N/A
Lille	34101	1 ,102,002	0.0.7.					equipment.	
					1			Bypass necessary	
, <u>-</u>	0)./4.54	NOx/SO2	5/9/19 10:42	5/9/19 10:57	14	YES	14	to protect plant	N/A
Line 7	SV151	NOXIGOZ	3/3/13 10.42	010,10 10,01				equipment.	
<u></u>	<u> </u>				 		 	Bypass necessary	-
	1		E4440 540	EM 4140 E-40	35	YES	35	to protect plant	N/A
Line 7	SV151	NOx/SO2	5/14/19 5:13	5/14/19 5:48	33	1.5		equipment.	
					 	 	 	Bypass necessary	
	1				1	V=0		to protect plant	N/A
Line 7	SV151	NOx/SO2	5/26/19 14:05	5/26/19 14:30	25	YES	25	equipment.	1973
							<u> </u>	<u> </u>	
					1			Bypass necessary	51/4
Line 7	SV151	NOx/SO2	5/26/19 14:30	5/26/19 14:45	15	YES	15	to protect plant	N/A
		1				<u> </u>		equipment.	<u> </u>
	ļ							Bypass necessary	
Line 7	SV151	NOx/SO2	5/26/19 17:49	5/26/19 17:59	10	YES	10	to protect plant	N/A
£iiie /	30131	NOXOOZ	0,20,70					equipment.	<u> </u>
	<u> </u>		·····				<u> </u>	Bypass necessary	
l	01/454	NO(CO2	5/29/19 16:30	5/29/19 16:55	25	YES	25	to protect plant	N/A
Line 7	SV151	NOx/SO2	3/29/18 10:30	3/23/10 10:00		1		equipment.	
		<u> </u>	<u> </u>	- 				Bypass necessary	
ļ			P/00/40 7-08	5/30/19 8:08	32	YES	32	to protect plant	N/A
Line 7	SV151	NOx/SO2	5/30/19 7:36	5/30/19 6.06	32	120	02	equipment.	-
				<u> </u>	ļ			Bypass necessary	
	ļ			24450577		VEC	50	to protect plant	N/A
Line 7	SV151	NOx/SO2	6/4/19 0:06	6/4/19 0:57	50	YES	50	equipment.	
									
					1			Bypass necessary	N/A
Line 7	SV151	NOx/SO2	6/5/19 9:06	6/5/19 9:44	38	YES	38	to protect plant	I N/A
							<u> </u>	equipment.	
								Bypass necessary	
Line 7	SV151	NOx/SO2	6/8/19 19:21	6/8/19 21:26	125	YES	125	to protect plant	N/A
Linio	00.00	1,10,1				i		equipment.	
	+	 						Bypass necessary	
1: 7	01/454	NOx/SO2	6/13/19 9:59	6/13/19 14:30	271	YES	271	to protect plant	N/A
Line 7	SV151	1102/302	0/10/10 0.00	0, (0, 10 1, 1,00				equipment.	
		 	 	<u></u>	-			Bypass necessary	
		110 1005	0/40/40/44/00	6/13/19 19:00	270	YES	270	to protect plant	N/A
Line 7	SV151	NOx/SO2	6/13/19 14:30	0,13/19 19.00	1 2,0	1		equipment.	
				 		 	 	Bypass necessary	
				0110110 00 00	040	VEC	210	to protect plant	N/A
Line 7	SV151	NOx/SO2	6/13/19 19:00	6/13/19 22:30	210	YES	210	equipment.	1
1	1			 					,
	T					,		Bypass necessary	N/A
Line 7	SV151	NOx/SO2	6/13/19 22:30	6/14/19 6:30	480	YES	480	to protect plant	IN/A
	•							equipment.	
	 		1	1		1	1	Bypass necessary	
Line 7	SV151	NOx/SO2	6/14/19 6:30	6/14/19 7:00	30	YES	30	to protect plant	N/A
Line /	37131	1102002	1		Į.			equipment.	
-	- 		 					Bypass necessary	
1	0.454	NOWEOR	6/14/19 7:00	6/14/19 8:12	72	YES	72	to protect plant	N/A
Line 7	SV151	NOx/SO2	0/14/18/7.00	0/1-//10 0.12	'-			equipment.	

5) Monitor Bypasses: Provide the following information for each period in which an emission unit is operating but is not being monitored because emissions were either partially or totally diverted around the monitoring system See Minn. R. 7017.1110 subp. 2c

5a)	5b)	5c)	5d)	5e)	5f)	5g)	5h)	5í)	5j)
Monitor ID number	Emission Unit Required to be Monitored	Pollutant and Limit Required to be Monitored	Beginning Date and Time of Bypass Period	End date and time of bypass period	Duration of monitor bypass (minutes)	Was P.C.E. operating during bypass period?	Duration of allowable monitor bypass	Reason for monitor bypass (clarifying comments)	Corrective action taken (clarifying comments)
.,,,,,									
					<u> </u>		<u> </u>		
				41/111					
							<u> </u>		
		<u> </u>	5k) Total	duration of allo	wable monito	or bypass:	372	hours	

6) CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Signature of Responsible Official	Lawrence Sutherland Printed Name of Responsible Official
General Manager - Minnesota Ore Operations Title	July 29, 2019 Date

OMS aud	Operating		1	Last audit			Next test	
em	hours	Monitor ID	Pollutant	date	Cal error results	Pass/fail	due by:	Comments
.l/A								
I/A	<u> </u>	<u> L</u>	<u> </u>	<u> </u>	· ************************************		<u> </u>	
ylinder	gas audit's	(CGA)						
mission	Operating	***************************************		Last audit	C-1 "	Dags (5-2)	Next test	Comments
ınit	hours	Monitor ID	Pollutant	date	Cal error results Low 0.2%	Pass/fail	due by:	Comments
SV103		MR001	NOx	2/21/2019	Mid 1.4%	Pass	9/30/2019	RATA 2nd Qtr
			- i i i i i i i i i i i i i i i i i i i		Low 1.2%			Data and Oth
SV118		MR002	NOx	2/21/2019	Mid 0.5%	***************************************	9/30/2019	RATA 2nd Qtr
21/497		MR003	NOx	2/21/2019	Low 2.6% Mid 1.6%		9/30/2019	RATA 2nd Qtr
SV127		INITOUS	INUA		Low 0.7%			
SV144		MR004	NOx	2/22/2019	Mid 0.2%	1000000	9/30/2019	RATA 2nd Qtr
		MDOCC	NO.	2/22/2010	Low 1.8% Mid 2.1%		9/30/2019	RATA 2nd Qtr
SV151		MR005	NOx	2/22/2019	Low 6,8%		J10012010	
SV103		MR001	SO2	2/21/2019	Mid 2.7%	Pass	9/30/2019	RATA 2nd Qtr
					Low 0.0%		0/00/2010	BATA 2nd Otr
SV118		MR002	SO2	2/21/2019	Mid 0.0% Low 3,4%		9/30/2019	RATA 2nd Qtr
SV127		MR003	SO2	2/21/2019	Mid 1.6%	Pass	9/30/2019	RATA 2nd Qtr
					Low 1.2%		0/00/0045	DATA 2nd Ofr
SV144	ļ	MR004	SO2	2/22/2019	Mid 0.9% Low 0.5%		9/30/2019	RATA 2nd Qtr
SV151		MR005	SO2	2/22/2019	Mid 2.3%		9/30/2019	RATA 2nd Qtr
A (A)		111111111111111111111111111111111111111						
						<u> </u>		HARONS HARONS
inearity	/					,		
mission	Operating			Last audit	0-1	Deec/fell	Next test	Comments
ınit	hours	Monitor ID	Pollutant	date	Cal error results		due by:	Comments
					Mic	1		
N/A					High	1	<u></u>	CHICANO, LICANOST LICANOST
Relative	accuracy	test audit (RATA)					- Comments
mission	Operating			Last audit	Relative	Pass/fail	Next test due by:	Comments
ınit		1				rass/rail	lane by:	COMMISSION
	hours	Monitor ID	Pollutant	date	accuracy			
	hours	Monitor ID	Pollutant	date	accuracy			
SV103	hours 1828	Monitor ID MR001	Pollutant SO2	5/15/2019	4.6%	Pass	2nd Qtr 2020	
SV103						Pass		
	1828	MR001	SO2	5/15/2019		Pass Pass		
, , , , , , , , , , , , , , , , , , ,					4.6%		2nd Qtr 2020	
SV103 SV103	1828	MR001 MR001	SO2	5/15/2019 5/15/2019	4.6% 6.3%	Pass	2nd Qtr 2020 2nd Qtr 2020	
	1828	MR001	SO2	5/15/2019	4.6%		2nd Qtr 2020	
SV103	1828	MR001 MR001	SO2	5/15/2019 5/15/2019	4.6% 6.3%	Pass	2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020	
SV103 SV118	1828	MR001 MR001	SO2	5/15/2019 5/15/2019	4.6% 6.3%	Pass	2nd Qtr 2020 2nd Qtr 2020	
SV103 SV118	1828 1828 2106	MR001 MR001 MR002	SO2 NOx SO2	5/15/2019 5/15/2019 5/16/2019	4.6% 6.3% 16.2%	Pass	2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020	
SV103 SV118 SV118	1828 1828 2106	MR001 MR001 MR002 MR002	SO2 NOX SO2	5/15/2019 5/15/2019 5/16/2019	6.3% 16.2%	Pass	2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020	
SV103 SV118 SV118	1828 1828 2106	MR001 MR001 MR002	SO2 NOx SO2	5/15/2019 5/15/2019 5/16/2019	4.6% 6.3% 16.2%	Pass Pass	2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020	
SV103 SV118 SV118 SV127	1828 1828 2106 2106	MR001 MR002 MR002 MR002 MR003	SO2 NOx SO2 NOx	5/15/2019 5/15/2019 5/16/2019 5/16/2019	6.3% 16.2% 6.3%	Pass Pass Pass	2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020	
SV103 SV118 SV118 SV127	1828 1828 2106	MR001 MR001 MR002 MR002	SO2 NOX SO2	5/15/2019 5/15/2019 5/16/2019	6.3% 16.2%	Pass Pass	2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020	
SV103 SV118 SV118 SV127	1828 1828 2106 2106	MR001 MR002 MR002 MR002 MR003	SO2 NOx SO2 NOx	5/15/2019 5/15/2019 5/16/2019 5/16/2019	6.3% 16.2% 6.3%	Pass Pass Pass	2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020	
SV103 SV118 SV118 SV127	1828 1828 2106 2106	MR001 MR002 MR002 MR002 MR003	SO2 NOx SO2 NOx	5/15/2019 5/15/2019 5/16/2019 5/16/2019	6.3% 16.2% 6.3%	Pass Pass Pass	2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020 2nd Qtr 2020	
SV103 SV118 SV118 SV127	1828 2106 2106 2142	MR001 MR002 MR002 MR003 MR003	SO2 NOX SO2 NOX SO2	5/15/2019 5/15/2019 5/16/2019 5/16/2019 5/20/2019	6.3% 16.2% 6.3% 4.9%	Pass Pass Pass Pass	2nd Qtr 2020	
SV118 SV118 SV127 SV127 SV144	1828 2106 2106 2142 2142 2094	MR001 MR002 MR002 MR003 MR003	SO2 NOX SO2 NOX SO2 NOX SO2	5/15/2019 5/15/2019 5/16/2019 5/16/2019 5/20/2019 5/20/2019	6.3% 16.2% 6.3% 4.9%	Pass Pass Pass Pass Pass	2nd Qtr 2020	
SV103	1828 2106 2106 2142	MR001 MR002 MR002 MR003 MR003	SO2 NOX SO2 NOX SO2	5/15/2019 5/15/2019 5/16/2019 5/16/2019 5/20/2019	6.3% 16.2% 6.3% 4.9%	Pass Pass Pass Pass	2nd Qtr 2020	
SV118 SV118 SV127 SV127 SV144	1828 2106 2106 2142 2142 2094	MR001 MR002 MR002 MR003 MR003	SO2 NOX SO2 NOX SO2 NOX SO2	5/15/2019 5/15/2019 5/16/2019 5/20/2019 5/20/2019 5/22/2019	6.3% 16.2% 6.3% 4.9% 16.7%	Pass Pass Pass Pass Pass Pass	2nd Qtr 2020	
SV118 SV118 SV127 SV127 SV144	1828 2106 2106 2142 2142 2094	MR001 MR002 MR002 MR003 MR003	SO2 NOX SO2 NOX SO2 NOX SO2	5/15/2019 5/15/2019 5/16/2019 5/16/2019 5/20/2019 5/20/2019	6.3% 16.2% 6.3% 4.9%	Pass Pass Pass Pass Pass	2nd Qtr 2020	
SV118 SV118 SV127 SV127 SV144 SV144	1828 2106 2106 2142 2142 2094	MR001 MR002 MR002 MR003 MR003 MR004 MR004	SO2 NOX SO2 NOX SO2 NOX NOX	5/15/2019 5/15/2019 5/16/2019 5/20/2019 5/20/2019 5/22/2019	6.3% 16.2% 6.3% 4.9% 16.7%	Pass Pass Pass Pass Pass Pass	2nd Qtr 2020	
SV118 SV118 SV127 SV127 SV144 SV144	1828 2106 2106 2142 2142 2094 2094	MR001 MR002 MR002 MR003 MR003 MR004 MR004	SO2 NOX SO2 NOX SO2 NOX NOX	5/15/2019 5/15/2019 5/16/2019 5/20/2019 5/20/2019 5/22/2019	6.3% 16.2% 6.3% 4.9% 16.7%	Pass Pass Pass Pass Pass Pass	2nd Qtr 2020	
SV103 SV118 SV118 SV127 SV127 SV144	1828 2106 2106 2142 2142 2094	MR001 MR002 MR002 MR003 MR003 MR004 MR004	SO2 NOX SO2 NOX SO2 NOX SO2 NOX SO2	5/15/2019 5/15/2019 5/16/2019 5/16/2019 5/20/2019 5/22/2019 5/22/2019	6.3% 16.2% 6.3% 4.9% 16.7% 4.0% 13.1%	Pass Pass Pass Pass Pass Pass	2nd Qtr 2020 2nd Qtr 2020	
SV118 SV118 SV118 SV127 SV127 SV144 SV144	1828 2106 2106 2142 2142 2094 2094	MR001 MR002 MR002 MR003 MR003 MR004 MR004	SO2 NOX SO2 NOX SO2 NOX SO2 NOX SO2	5/15/2019 5/15/2019 5/16/2019 5/16/2019 5/20/2019 5/22/2019 5/22/2019	6.3% 16.2% 6.3% 4.9% 16.7% 4.0% 13.1%	Pass Pass Pass Pass Pass Pass	2nd Qtr 2020 2nd Qtr 2020	

TABLE 1

RATA RESULTS SUMMARY Line 3 Waste Gas Stack (SV103) May 15, 2019

Sulfur Dioxide Emission Rate	Sulfur Dioxide Emission Rate Relative Accuracy - Calculated Using the Reference Method Average Relative								
SO ₂ , lb/hr	Run 1 0817-0838	Run 2 0904-0925	Run 3 0941-1002	Run 4 1002-1023	Run 5 1042-1103	Run 6 1103-1124	Run 7 1139-1200	Run 8 1200-1221	Run 10 1302-1323
Ref. Method lb/hr	65.5	65,6	68.0	79.2	79.9	68.5	77.1	84.0	69.4
CEM lb/hr	61.8	63,0	66.6	74.9	76.5	66.8	75, 6	82,8	66,5
Difference	-3.7	-2.6	-1.4	-4.3	-3.4	-1.7	-1.5	-1.2	-2,9
Average Difference -2.5		Standard Deviation of the Differences			1.1	Relative Accuracy			4.6%
Confidence Coefficient	Average Reference Method, lb/hr 73.0			Average CEM, lb/hr			70.5		

Oxides of Nitrogen Emission Ra	te Relative Accuracy	- Calculated	Using the Ref	erence Metho	d Average	Relative Acc	uracy Limit	20%		
NO _x , lb/hr	Run 1 0817-0838	Run 2 0904-0925	Run 3 0941-1002	Run 4 1002-1023	Run 5 1042-1103	Run 6 1103-1124	Run 7 1139-1200	Run 9 1241-1302	Run 10 1302-1323	
Ref. Method lb/hr	170.4	171.2	156.9	182.2	166.9	158.2	181.6	184.2	184.0	
CEM lb/hr	177.3	178.1	168.0	188.6	175.6	167.1	192,5	196.4	195.3	
Difference	6.9	6,8	11.1	6.4	8.7	8,8	10.9	12.2	11.3	
Average Difference	9.2	Standard Deviation of the Differences 2.2			2.2	Relative Acc	uracy		6.3%	
Confidence Coefficient	1.7	Average Reference Method, lb/hr			172.9	9 Average CEM, lb/hr			182.1	

TABLE 2

RATA RESULTS SUMMARY Line 4 Waste Gas Stack (SV118) May 16, 2018

Sulfur Dioxide Emission Rate		Coloulated He	ing the Refere	nce Method	Average	Relative Acc	uracy Limit		20%
Sulfur Dioxide Emission Rate		Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	Run 9	Run 10
SO ₂₁ lb/hr	Run 1 1235-1256	1256-1317	1329-1350	1350-1411	1427-1448	1448-1509	1526-1547	1622-1643	1703-1724
	41.7	38.2	41.3	43.1	41.9	43.4	43.0	38.0	43.9
Ref. Method lb/hr	38.6	35.0	38.5	39.5	39.9	38.7	34.1	32.3	35.0
CEM lb/hr		-3.2	-2.8	-3.6	-2.0	-4.7	-8.9	-5.7	-8,9
Difference	-3.1 -4.8	Standard Deviation of the Differences		L	2.6 Relative Accuracy			16.2%	
Average Difference		Average Reference Method, lb/hr 41.6				Average CEN	A, lb/hr		36.8
Confidence Coefficient	2.0	Average Reit	A CHOO MIGHIOR						

Oxides of Nitrogen Emission Rat		Calculated 1	Ising the Ref	erence Metho	d Average	Relative Acc	uracy Limit		20%
Oxides of Nitrogen Emission Rat NO _x , lb/hr	Run 1	Run 2 1256-1317	Run 3 1329-1350	Run 4 1350-1411	Run 5 1427-1448	Run 6 1448-1509	Run 7 1526-1547	Run 8 1547-1608	Run 9 1622-1643
	1235-1256 226,2	231.8	227.3	234.6	241.5	241.7	238.6	225.5	205,4
Ref, Method lb/hr	227.8	241.4	235.7	248.9	252.3	255.0	247.1	239.3	223.5
CEM lb/hr	1.6	9.6	8.4	14.3	10.8	13.3	8.5	13.8	18,1
Difference Average Difference		Standard Deviation of the Differences			4.7	Relative Accuracy			6.3%
Confidence Coefficient	3.6	Average Refe	rence Method	, lb/hr	230.3	Average CEM, lb/hr			241.2

TABLE 3

RATA RESULTS SUMMARY Line 5 Waste Gas Stack (SV127) May 20, 2019

Sulfur Dioxide Emission Rate	Delative Agentacy -	Calculated Us	ing the Refere	ence Method	Average	Relative Acc	uracy Limit		20%
Sultur Dioxide Emission Rate	Run 1 0937-0958	Run 3 1052-1113	Run 4 1113-1134	Run 5 1146-1207	Run 6 1207-1228	Run 7 1245-1306	Run 8 1306-1327	Run 9 1340-1401	Run 10 1401-1422
Ref. Method lb/hr	42.8	38.1	43,5	45.9	40.3	42.8	36.9	41.1	41.5
CEM lb/hr	40.6	36.2	40.4	44.9	40.7	41.4	36.2	40.2	41.2
Difference	-2.2	-1.9	-3.1	-1.0	0.4	-1.4	-0.7	-0,9	-0.3
Average Difference	-1.2	Standard Deviation of the Differences				Relative Accuracy			4.9%
Confidence Coefficient	0.8	Average Reference Method, lb/hr			41.4	Average CEI	√ı, lb/hr		40.1

Oxides of Nitrogen Emission Rat	o Bolatino Accuracy	- Calculated I	Ising the Ref	erence Metho	d Average	Relative Acc	uracy Limit		20%
Oxides of Nitrogen Emission Rat	Run 1	Run 2	Run 3	Run 4	Run 5	Run 6	Run 7	Run 8	Run 10
NO _X , lb/hr	0937-0958	1010-1031	1052-1113	1113-1134	1146-1207	1207-1228	1245-1306	1306-1327	1401-1422
	386.7	402.0	346.7	371.4	383.8	385.8	382.4	387.5	372.8
Ref. Method lb/hr	431.8	442.8	392.2	424.6	443.9	452.4	443.1	449.7	439.9
CEM lb/hr	45.2	40.8	45.5	53.2	60.1	66.6	60.7	62.2	67.0
Difference			1		9.9	Relative Acc	uracy		16.7%
Average Difference		Standard Deviation of the Differences Average Reference Method, lb/hr			379.9				435.1
Confidence Coefficient	7.6	Average Refe	rence Menico	nce Method, Ib/III		I World of Control			

TABLE 4

RATA RESULTS SUMMARY Line 6 Waste Gas Stack (SV144) May 22, 2019

o Ir. Di da Eninte Poto	Sulfur Dioxide Emission Rate Relative Accuracy - Calculated Using the Reference Method Average Relative Accuracy Limit										
	Run 1	Run 2	Run 3	Run 4	Run 6	Run 7	Run 8	Run 9	Run 10		
SO ₂ , lb/hr	0950-1011	1139-1200	1235-1256	1256-1317	1353-1414	1429-1450	1450-1511	1524-1545	1545-1606		
Ref. Method lb/hr	32.4	21.6	53.7	70.2	37.3	47.1	46,3	42.9	42.4		
	30.0	22.0	52.5	68.6	36.3	45.3	45.1	42.4	42.5		
CEM lb/hr		0.4	-1.2	-1.6	-1.0	-1.8	-1.2	-0.5	0.1		
Difference			Standard Deviation of the Differences		0.9	Relative Acc	uracv		4.0%		
Average Difference						Average CEM, lb/hr		42.8			
Confidence Coefficient	0.7	Average Refe	erence Method	, lb/nr	43.6	Average CLI	VI, 107111				

Oxides of Nitrogen Emission Ra	to Polative Accuracy	- Calculated I	Ising the Ref	erence Metho	d Average	Relative Acc	uracy Limit		20%
NO _x , lb/hr	Run 1 0950-1011	Run 2 1139-1200	Run 3 1235-1256	Run 4 1256-1317	Run 5 1332-1353	Run 6 1353-1414	Run 7 1429-1450	Run 9 1524-1545	Run 10 1545-1606
Ref. Method lb/hr	233.5	193.5	292.6	324.5	266.1	264.5	276.1	266.2	266.4
CEM ib/hr	258.6	214,1	326.1	362.0	294.4	297.8	309.7	297.2	299.6
Difference	25.1	20.6	33.5	37.5	28.2	33.3	33.6	31.0	33.2
Average Difference		Standard Deviation of the Differences		5.2	Relative Accuracy			13.1%	
Confidence Coefficient	4.0	Average Reference Method, lb/hr			264.8	Average CEM, lb/hr			295.0

TABLE 5

RATA RESULTS SUMMARY Line 7 Waste Gas Stack (SV151) May 21, 2019

O. IS. Bl. ide Emission Bata	Sulfur Dioxide Emission Rate Relative Accuracy - Calculated Using the Reference Method Average Relative Accuracy Limit									
SO ₂ , lb/hr	Run 1 1025-1046	Run 2 1046-1107	Run 3	Run 4 1140-1201	Run 5 1213-1234	Run 6 1234-1255	Run 7 1309-1330	Run 8 1330-1351	Run 9 1412-1433	
Ref. Method lb/hr	41.4	40,2	36.0	34.4	40.9	27.9	27.2	30.6	30.9	
CEM lb/hr	41.8	42,9	38.5	38.1	45.5	33.6	32.7	36.5	38.4	
Difference	0.4	2.7	2.5	3.7	4.6	5.7	5.5	5.9	7.5	
Average Difference	4.3	Standard Deviation of the Differences 2.2			2.2	Relative Acc			17.3%	
Confidence Coefficient	1.7	Average Reference Method, lb/hr 34.4		Average CEM, lb/hr			38.7			

Oxides of Nitrogen Emission Ra	n Dolotivo Accuracy	- Calculated I	Ising the Ref	erence Metho	d Average	Relative Acc	uracy Limit		20%
NO _x , lb/hr	Run 1 1025-1046	Run 2 1046-1107	Run 3 1119-1140	Run 4 1140-1201	Run 5 1213-1234	Run 6 1234-1255	Run 7 1309-1330	Run 8 1330-1351	Run 10 1448-1509
Ref. Method lb/hr	213.4	211.6	213.2	213.9	212.0	181,4	192.7	190.9	193.5
CEM lb/hr	207.7	209.1	213.8	213,9	215.9	178.5	183.5	185.7	188.4
·	-5.7	-2.5	0.6	0,0	3.9	-2.9	-9.2	-5.2	-5.1
Difference Average Difference		Standard Deviation of the Differences		4.0	Relative Accuracy			2.9%	
Confidence Coefficient	3.0	Average Reference Method, lb/hr			202.5	Average CEM, lb/hr			201.0

Summary Table by Monitor Downtime Type U. S. Steel - Minntac 2nd Quarter 2019

NOx

Line 3 1 Automatic Calibration 0 Data Handling System Malfun 0 Excess Drift Ancillary Analyze 0 Excess Drift Primary Analyzer 0 Primary Analyzer Malfunction 0 Sample Interface Malfunction Line 4 2 Automatic Calibration	r
0 Excess Drift Ancillary Analyze 0 Excess Drift Primary Analyzer 0 Primary Analyzer Malfunction 0 Sample Interface Malfunction Line 4 2 Automatic Calibration	r
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	ction
Data Handling System Malfun	
0 Excess Drift Ancillary Analyze	
0 Excess Drift Primary Analyzer	
0 Primary Analyzer Malfunction	
Line 5 4 Automatic Calibration	
0 Data Handling System Maifun	ction
5 Secondary Analyzer Malfuncti	on
0 Excess Drift Primary Analyzer	1
16 Primary Analyzer Malfunction	
Line 6 8 Automatic Calibration	
0 Data Handling System Malfun	ction
8 Secondary Analyzer Malfuncti	on
0 Excess Drift Primary Analyzer	
29 Primary Analyzer Malfunction	
Line 7 8 Automatic Calibration	
0 Data Handling System Malfun	ction
8 Secondary Analyzer Malfuncti	
0 Excess Drift Primary Analyzer	
1 Primary Analyzer Malfunction	
0 Preventative Maintenance	

SO2

Line	Duration (Hrs)	Description
Line 3	1	Automatic Calibration
	0	Data Handling System Malfunction
	0	Excess Drift Ancillary Analyzer
	0	Excess Drift Primary Analyzer
	0	Primary Analyzer Malfunction
Line 4	3	Automatic Calibration
	0	Data Handling System Malfunction
	0	Excess Drift Ancillary Analyzer
	0	Excess Drift Primary Analyzer
	0	Primary Analyzer Malfunction
	0	Preventative Maintenance
Line 5	6	Automatic Calibration
	0	Data Handling System Malfunction
	5	Secondary Analyzer Malfunction
	1	Excess Drift Primary Analyzer
	16	Primary Analyzer Malfunction
	0	Preventative Maintenance
Line 6	10	Automatic Calibration
	1	Sample Interface Malfunction
	8	Secondary Analyzer Malfunction
	1	Excess Drift Primary Analyzer
	26	Primary Analyzer Malfunction
Line 7	7	Automatic Calibration
	0	Data Handling System Malfunction
	8	Secondary Analyzer Malfunction
	0	Excess Drift Primary Analyzer
	1	Primary Analyzer Malfunction